



UNITED STATES PROVISIONAL PATENT APPLICATION

FOR A

METHOD AND APPARATUS FOR A DYNAMIC AUCTION  
ENVIRONMENT

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METHOD AND APPARATUS FOR A DYNAMIC AUCTION ENVIRONMENT

Background of the Invention

Field of the Invention:

The present invention relates to a dynamic auction environment. More particularly, the present invention relates to a dynamic auction environment that provides an intuitive and interactive real-time auction interface ("Pitometer") for use by buyers and sellers within an auction environment.

Background:

There has recently been a tremendous growth in the number of computers connected to the Internet. A client computer connected to the Internet is capable of interacting with other client computers or servers within any network environment, such as the Internet. Accordingly, client application software typically accepts commands from a user and perform operational tasks by sending requests to server applications running on server computers. A number of protocols may be used to exchange commands and data between computers connected to the Internet. For instance, the protocols may include the File Transfer Protocol (FTP), the Hyper Text Transfer Protocol (HTTP), the Simple Mail Transfer Protocol (SMTP), and the Gopher document protocol. The Internet is an information medium capable of providing documents and information, as well as enabling business transactions (e.g., e-commerce) between various parties or clients connected to the Internet. The Internet is made up of numerous Web sites located around the world that enable a wide variety of business transactions between different entities or clients.

A Web browser is a client application or, preferably, an integrated operating system utility that communicates with server computers via FTP, HTTP and Gopher protocols. Web browsers enable different users access to a wide variety of informational and business resources available from a wide variety of different networks and sources and presents them to a user. Web browsers receive content from a server sent over the Internet that is typically encoded in Hyper Text Markup Language (HTML) and executed by the browser on a client computer.

To go beyond what is possible with HTML scripts, browsers typically support the usage of additional components such as Java Applets, ActiveX Controls, and Plug-Ins that provide extra functionality. These additional components, commonly referred to as "client bits," are typically stored as executables in the memory of the client computer, and can be installed onto the client computer directly from a storage medium or downloaded from a server over the Internet. The functional components such as Java Applets, ActiveX Controls, and Plug-Ins are mapped into the script so that actions, methods, or properties of an object can be called therefrom. (ActiveX Controls are reusable software components that incorporate ActiveX technology, which enables software applications to interact with one another in a networked environment regardless of the language in which the components were created. ActiveX Controls can be embedded in Web pages to produce animation and other multimedia effects, interactive objects and sophisticated applications. ActiveX Controls can be written in a variety of programming languages, including C, C++, Visual Basic, and Java. A Plug-In, on the other hand, is a software component designed to plug into the Netscape Navigator browser, and to permit the browser to access and execute files embedded in HTML documents that are in formats the browser normally would not normally recognize.)

Moreover, Web browsers typically contain an associated scripting space, which is memory space allocated for a browser instance, for the reception of electronic data called a script. Web browsers receive scripts from the network into the scripting space and execute instructions contained in the script. One such instruction contained in a script might be presenting data to a user, usually by way of an output device such as a computer monitor. In addition to data for presentation to a user, the script may also contain mappings to objects and services stored in the memory of a client computer and instructions for interaction with or communication to and from those objects and services. A script might also contain additional instructions as well. An exchange between script instructions in a scripting space and a service or object can be facilitated by additional objects, such as a Plug-In or ActiveX control. In these cases, a mapping to the Plug-In or ActiveX control is contained in the script, and the Plug-In or ActiveX control performs some operation towards carrying out the script instruction.

Through such enabling technology, clients or users associated with a networked environment, such as the Internet, are capable of conducting a wide variety of different business transactions on the Internet. One common business transaction that is becoming increasingly popular is the on-line auctioning (e.g., e-auctions) of goods and services.

Currently, e-auctions, which are conducted in a networked environment, are limited in the types of information provided to auction participants. The typical auction participant (i.e., buyers and sellers) generally lists a product or service, or solicits a product or service, on an auction site, whereupon participating auction participants bid upon the product or service of interest to them. Generally, the listing of an offered product or service, either offered or solicited, is placed in a standard HTML text listing at a particular e-auction site. Correspondingly, auction participants may submit a bid or solicit offers, typically via electronic mail, for a particular product or service. Generally, the auction participants do not have access to auction information, such as the bids of other auction participants, other than the current asking price of the offered or solicited product or service. As such, auction participants are generally not aware of the dynamics of a current active auction, such as: information on other offers or bids from other auction participants; whether a particular auction transaction has been completed; where the auction participant's offers or bids compare with other auction participants; and a variety of other informational auction dynamics.

Moreover, the typical auction environment has general latency problems with respect to the efficiency at which bids and offers are processed and updated. As is common with current auction systems, a series of different bids or offers, which are typically sent through electronic messages (e.g., e-mail), may be received by a particular auction system but may not be effectively processed in an expeditious manner. As such, some auction participants are delayed or excluded from effectively participating in particular auctions, as a result of the inefficiencies in the processing of offers and bids received from auction participants.

As such, current auction techniques do not provide auction participants information regarding current auction dynamics. Moreover, current auction techniques are plagued with the inefficient processing of bids and offers submitted by auction

participants. The present invention attempts to offer a solution to the shortfalls of currently implemented auction environments.

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## DETAILED DESCRIPTION / OVERVIEW

The following detailed description sets forth numerous specific details to provide a thorough understanding of the invention. However, those of ordinary skill in the art will appreciate that the invention may be practiced without these specific details. In other instances, well-known methods, procedures, protocols, components, algorithms, and circuits have not been described in detail so as not to obscure the invention.

In one embodiment, the steps or process of the present invention are embodied in machine-executable instructions, such as computer instructions. The instructions can be used to cause a general-purpose or special-purpose processor that is programmed with the instructions to perform the steps of the present invention. Alternatively, the steps of the present invention might be performed by specific hardware components that contain hardwired logic for performing the steps, or by any combination of programmed computer components and custom hardware components.

The present invention is generally directed to a dynamic auction environment that provides an intuitive and interactive real-time auction interface ("Pitometer") to both buyer and seller within an auction environment.

### Computer Environment

Figure 1 and the following description are intended to provide a general description of a suitable computing environment in which the invention may be implemented. In one embodiment, although not necessarily required, the invention will be described in the general context of computer-executable instructions, such as program modules, being executed by a computer, such as a client workstation or a server.

Generally, program modules include routines, programs, objects, components, data structures and the like that perform particular tasks or implement particular abstract data types. Moreover, those skilled in the art will appreciate that the invention may be practiced with other computer system configurations, including hand-held devices, multi-processor systems, microprocessor-based or programmable consumer electronics, network PCs, minicomputers, mainframe computers and the like. The invention may also be practiced in distributed computing environments where tasks are performed by remote

processing devices that are linked through a communications network. In a distributed computing environment, program modules may be located in both local and remote memory storage devices.

As shown in Figure 1, an exemplary general purpose computing system may include a conventional personal computer 20 or the like, including a processing unit 21, a system memory 22, and a system bus 23 that couples various system components including the system memory 22 to the processing unit 21. The system bus 23 may be any of several types of bus structures including a memory bus or memory controller, a peripheral bus, and a local bus using any of a variety of bus architectures. The system memory 22 may include read-only memory (ROM) 24 and random access memory (RAM) 25. A basic input/output system 26 (BIOS), containing the basic routines that help to transfer information between elements within the personal computer 20, such as during start-up, may be stored in ROM 24. The personal computer 20 may further include a hard disk drive 27 for reading from and writing to a hard disk (not shown), a magnetic disk drive 28 for reading from or writing to a removable magnetic disk 29, and an optical disk drive 30 for reading from or writing to a removable optical disk 31 such as a CD-ROM or other optical media. The hard disk drive 27, magnetic disk drive 28, and optical disk drive 30 may be connected to the system bus 23 by a hard disk drive interface 32, a magnetic disk drive interface 33, and an optical drive interface 34, respectively. The drives and their associated computer-readable media provide non-volatile storage of computer readable instructions, data structures, program modules and other data for the personal computer 20. Although the exemplary embodiment described herein may employ a hard disk, a removable magnetic disk 29, and a removable optical disk 31, or combination therefor, it should be appreciated by those skilled in the art that other types of computer readable media which can store data that is accessible by a computer, such as magnetic cassettes, flash memory cards, digital video disks, Bernoulli cartridges, random access memories (RAMs), read-only memories (ROMs) and the like may also be used in the exemplary operating environment.

A number of program modules may be stored on the hard disk, magnetic disk 29, optical disk 31, ROM 24 or RAM 25, including an operating system 35, one or more application programs 36, other program modules 37 and program data 38. A user may

enter commands and information into the personal computer 20 through input devices such as a keyboard 40 and pointing device 42. Other input devices (not shown) may include a microphone, joystick, game pad, satellite disk, scanner, or the like. These and other input devices are often connected to the processing unit 21 through a serial port interface 46 that is coupled to the system bus 23, but may be connected by other interfaces, such as a parallel port, game port, or universal serial bus (USB). A monitor 47 or other type of display device may also be connected to the system bus 23 via an interface, such as a video adapter 48. In addition to the monitor 47, personal computers may typically include other peripheral output devices (not shown), such as speakers and printers.

The personal computer 20 may operate in a networked environment using logical connections to one or more remote computers, such as a remote computer 49. The remote computer 49 may be another personal computer, a server, a router, a network PC, a peer device or other common network node, and typically includes many or all of the elements described above relative to the personal computer 20, although only a memory storage device 50 has been illustrated in Figure 1. The logical connections depicted in Figure 1 include a local area network (LAN) 51 and a wide area network (WAN) 52. Such networking environments are commonplace in offices, enterprise-wide computer networks, intranets, and the Internet.

When used in a LAN networking environment, the personal computer 20 is connected to the LAN 51 through a network interface or adapter 53. When used in a WAN networking environment, the personal computer 20 typically includes a modem 54 or other means for establishing communications over the wide area network 52, such as the Internet. The modem 54, which may be internal or external, is connected to the system bus 23 via the serial port interface 46. In a networked environment, program modules depicted relative to the personal computer 20, or portions thereof, may be stored in the remote memory storage device. It will be appreciated that the network connections shown are exemplary and other means of establishing a communications link between the computers may be used.

## Network Environment

As noted, the computer described above can be deployed as part of a computer network. In general, the above description applies to both server computers and client computers deployed in a network environment. Figure 2 illustrates one such exemplary network environment in which the present invention may be employed. As shown in Figure 2, a number of servers 10a, 10b, etc., are interconnected via a communications network 160 (which may be a LAN, WAN, intranet or the Internet) with a number of client computers 20a, 20b, 20c, etc.. In a network environment in which the communications network 160 is, for example, the Internet, the servers 10 can be Web servers with which the clients 20 communicate via any of a number of known protocols such as, for instance, hypertext transfer protocol (HTTP). Each client computer 20 can be equipped with a browser 180 to gain access to the servers 10, and client application software 185. As shown in the embodiment of Figure 2, server 10a includes or is coupled to a dynamic database 12.

As shown, the database 12 may include database fields 12a, which contain information about items stored in the database 12. For instance, the database fields 12a can be structured in the database in a variety of ways. The fields 12a could be structured using linked lists, multi-dimensional data arrays, hash tables, or the like. This is generally a design choice based on ease of implementation, amount of free memory, the characteristics of the data to be stored, whether the database is likely to be written to frequently or instead is likely to be mostly read from, and the like. A generic field 12a is depicted on the left side. As shown, a field generally has sub-fields that contain various types of information associated with the field, such as an ID or header sub-field, type of item sub-field, sub-fields containing characteristics, and so on. These database fields 12a are shown for illustrative purposes only, and as mentioned, the particular implementation of data storage in a database can vary widely according to preference.

Thus, the present invention can be utilized in a computer network environment having client computers for accessing and interacting with the network and a server computer for interacting with client computers and communicating with a database with stored inventory fields. Likewise, the dynamic auction environment of the present invention can be implemented with a variety of network-based architectures, and thus

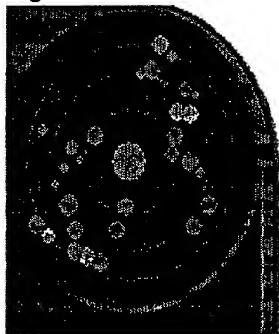
should not be limited to the examples shown. The present invention will now be described in more detail with reference to preferred embodiments.

### Pitometer Overview

As mentioned above, the present invention is generally directed to a dynamic auction environment that provides an intuitive and interactive real-time auction interface (“Pitometer”) to both buyer and seller within an auction environment.

The present invention employs the use of a dynamic interactive user interface (“UI”), which in one embodiment is a combination of template-generated html pages and dynamic content (Java and DHTML being one possible implementation). A specialized component of the UI, also referred to as a “Pitometer”, is a unique visualization and auction control device that has not been seen before in the marketplace. One embodiment of the UI is illustrated in the graphical representation of Figure 3 below:

Fig. 3. The Pitometer



In one embodiment, a seller or buyer is represented by a large circle, e.g., large “sun”, in the center of the Pitometer, and individual buyers or sellers are depicted by smaller circles, e.g., the small “planets”, around the periphery of the large center circle. The Pitometer provides a dynamic, real-time visualization and control tool which depicts action in the marketplace or auction environment. For example, as the prices offered by the buyers for a particular product or service move closer (Figure 4) and farther away (Figure 5) from the target or desired price of the seller of the particular product or service, the graphical representations of the buyers move proportionally on the display of

the UI. The display functions symmetrically with respect to buyers and sellers; that is, either a seller can be represented in the center, surrounded by many buyers, or a buyer can be depicted surrounded by many sellers. In one embodiment, the Pitometer may also be used to represent many buyers and sellers at the same time (see subheading (n), and Figure 18, below).

Fig. 4

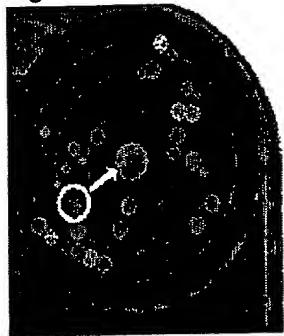
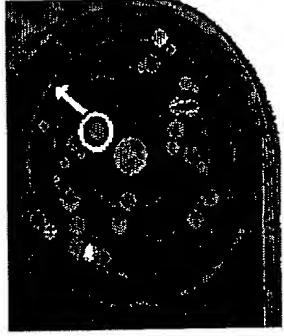


Fig. 5

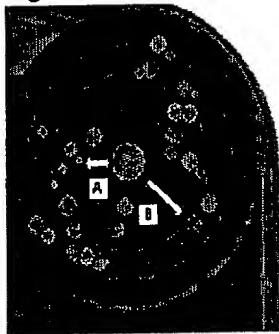


It is understood that other shapes and configurations (e.g., graphical or visual representations) of the present Pitometer or UI may be employed in accordance with the general concepts of the present invention. For instance, other shapes and configurations besides circles and circular peripheries (e.g., graphs, meters, etc.) could be used to represent the buyers and sellers and their respective correlation to each other. In one embodiment, the seller or buyer may be represented on the top of a 'hill or mound' wherein the corresponding sellers or buyers, depending upon the chosen scenario, are illustrated along the 'slopes' of the hill or mound, such that when the prices offered by the buyers for a particular product or service move closer and farther away from the target or desired price of the seller of the particular product or service, the graphical representations of the buyers move proportionally on the display (e.g., up or down the slopes of the hill or mound) of the UI.

## I. Data Display and Visualization

(a) In one embodiment, the distance (spatial displacement) between the buyer and seller represents the degree to which transactions are close to consummation (see Figure 6). In one embodiment, this distance is updated dynamically, giving the users a clear impression of movement in the market. As such, the display is not static; no action need be taken by the user to watch the updated information.

Fig. 6



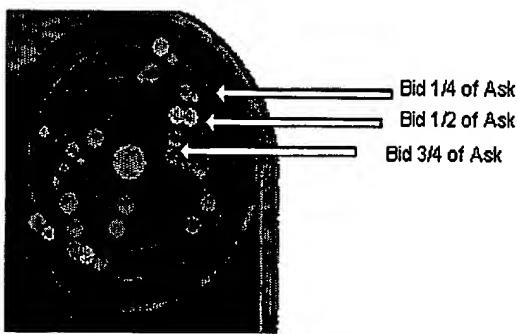
In the example of Figure 6, the transaction represented by "A" is closer to consummation than the transaction represented by "B". Correspondingly, a transaction takes place when the distance between a buyer and seller goes to zero. In this depiction, an offer would travel to the center of the Pitometer and the transaction would be consummated.

(b) The movement of the buyers and sellers on the display produces an "at-a-glance" knowledge of market changes and conditions.

(c) In one embodiment, distance (in price or "score" produced by a multi-parametric weighting) is represented on a logarithmic scale. This basically means that movements in the market are accelerated near the center. These accelerated movements produce a heightened awareness of market conditions near the consummation of a transaction. As such, in one embodiment, the periphery or periphery zones surrounding a buyer or seller represent the level or "closeness" of consummation of a particular transaction.

In the embodiment illustrated in Figure 7, the grid lines are placed at  $\frac{1}{4}$  of the asking price,  $\frac{1}{2}$  of the asking price, and  $\frac{3}{4}$  of the asking price, respectively. The lines provide a more specific, immediate visual quantification of the progress of an offer. These lines could be given other value representations (e.g.  $\frac{1}{3}$ ,  $\frac{1}{2}$ ,  $\frac{2}{3}$ ) if desired. In addition, the Pitometer lines do not necessarily represent a percentage of an asking price; the lines may also represent the degree to which a proposal by a central buyer is met, in the case where the central "sun" is a buyer. In that case, the subtitles for Figure 7 would read "ask  $\frac{1}{4}$  of bid," "ask  $\frac{1}{2}$  of bid," etc. (Distance could also be represented in the Pitometer on a linear or other scale in place of the logarithmic scale.)

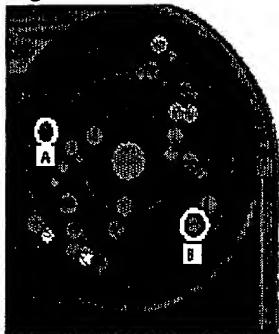
Fig. 7



(d) In one embodiment, the size of the graphical representation of a buyer or seller represents the number of items held (or desired) by the buyer or seller. (See Figure 8.) In this example, the offer represented by "B" (the larger of the two) represents an offer for a greater number of items than the smaller offer "A".

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Fig. 8



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(e) In one embodiment, color is used to convey information. As such, in one embodiment, the color of the graphical representation of a buyer or seller may be used to convey information about the seller, buyer, or desired transaction. For instance, in one embodiment, Asks are colored orange; bids are colored in blue (or vice versa as to bids and asks); the representations of particular buyers or sellers using the Pitometer are colored in red; updated offers are flashed yellow; and when a deal is consummated both parties' representations are briefly colored purple.

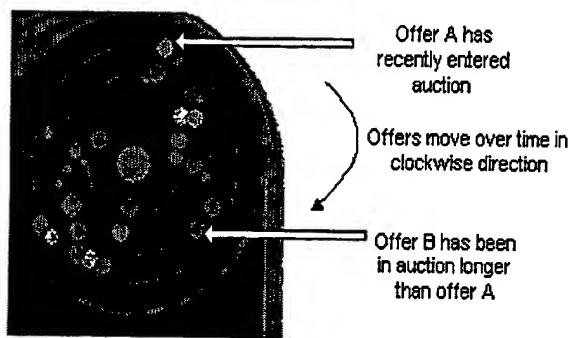
(f) As such, the flashing of updated offers in yellow and consummated transactions in purple gives an immediate visual impression of activity in the market.

(g) In one embodiment, sound is used to convey information as well. As such, in one embodiment, sounds may be used to represent the status of a transaction or the status of a buyer or seller with respect to a particular transaction. For instance, in one embodiment, when a transaction is consummated, a sound is produced. Likewise, in one embodiment, when new offers are entered into the Pitometer, a different sound is generated.

(h) In one embodiment, the angle (position in radians or degrees) of an offer on the Pitometer is used to convey information, such as the time a particular buyer or seller entered the auction. As illustrated in the embodiment of Figure 9, offerors enter the auction at 12 o'clock and travel clockwise around the circumference of the Pitometer as

time progresses. (The choice of clockwise or counterclockwise as a direction of travel is arbitrary).

Fig. 9



## II. Interactivity

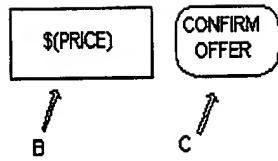
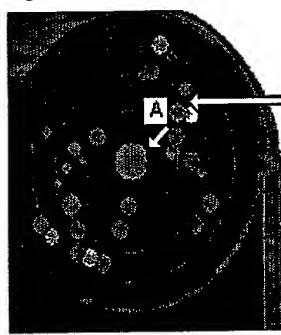
As mentioned above, the Pitometer is interactive and intuitive, and as such, provides users with an advantage over more ordinary and cumbersome methods of interacting with the marketplace. For instance, one such interactive feature is the ability to "drag and drop" in order to place and change offers through the user interface (UI). Different embodiments of the Pitometer may include the following features, in whole or in part, as listed below:

- (i) Buyers or sellers can move their respective offers in the marketplace or auction environment. For instance, in one embodiment, using an input device or medium (e.g., mouse, joystick, or other input system) a particular offer can be selected and moved on the Pitometer. As a result of the movement of the offer on the Pitometer or UI, a corresponding price change (or "score" change, in a multi-criteria auction) is automatically entered for that offer. The automatic entrance of the price change via movement of the offer on the Pitometer is a much easier method of entering or updating an offer as compared to older keyboard-based or template-based input systems. See Figure 10 (for an increasing offer) and Figure 11 (for a decreasing offer) for an illustrative example of this technique. Accordingly, as the offer is dragged through the

Pitometer field(s), the price at B is dynamically updated as the offer moves. The method described here (with a dynamically varying price display and a confirmation button) is one possible implementation of this system. It is not necessary to have a confirmation button (the system could work without such a button or without any confirmation feature at all). After an offer is confirmed, the new offer is sent to the auction engine.

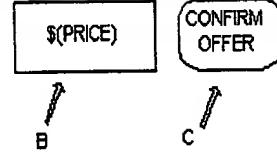
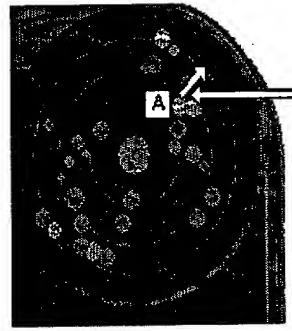
Additionally, in one embodiment, buyers or sellers can learn more about a proffered individual offer, such as quantity, price, and other information, through such techniques as a "mouse over" which may employ an arrow pointer that reveals offer details when the arrow pointer passes over the graphical representation of the offer on the Pitometer. In an alternate embodiment, a user may learn offer information or details by simply selecting an offer and "clicking" upon the graphical representation of the offer on the Pitometer or by employing other similar or like techniques.

Fig. 10



After moving the offer, buyer or seller can confirm the offer with a click on C.

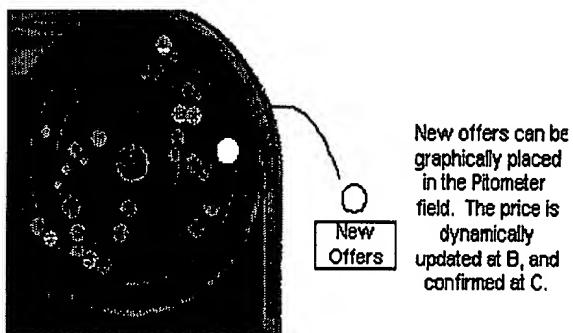
Fig. 11



Confirmation proceeds as before.

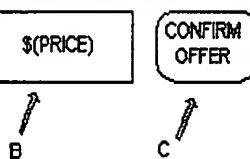
(j) In one embodiment, offers can be graphically entered and placed in the Pitometer field. See Figure 12. Offers can be removed from the Pitometer field in a similar fashion.

Fig. 12



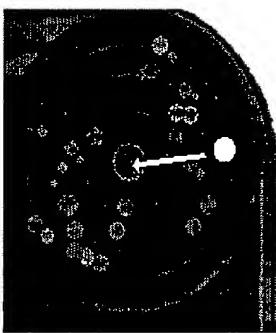
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New offers can be graphically placed in the Pitometer field. The price is dynamically updated at B, and confirmed at C.

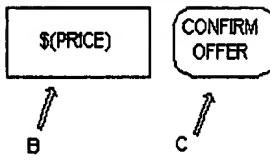


(k) In one embodiment, offers can be dragged to the center for consummation. In Figure 13, an offeror drags an offer to the center to consummate a transaction.

Fig. 13



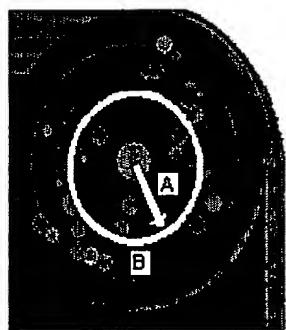
Offers can be dragged to the center for consummation. The price is given at B, and the user confirms at C.



(l) In one embodiment, a buyer or seller in the center can capture multiple offers at once through an innovative "pull" feature. This pull feature is illustrated in Figures 14 and 15. For example, as a seller in the center clicks in the center and drags outward, a dynamic screen calculation is made as to the number of offers inside the generated "ring" and how much money (in the case of offers defined by price) would be received by the seller if all the offers in the ring were accepted. In Figure 14, for example, approximately 9 offers have been captured inside the ring. In Figure 15, by way of contrast, approximately 24 offers have been captured. This interactive technique allows quick and intuitive cash and unit management for buyers and sellers, a functionality that has not been seen before in the marketplace. Note that offers inside the ring may represent different quantities; this is included in the quantity and price calculations.

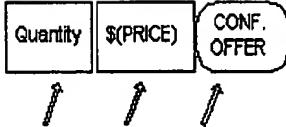
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Fig. 14



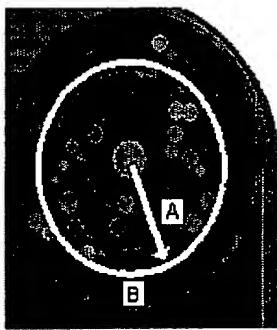
As the buyer or seller in center drags outward (see A) from the center, the display below dynamically updates number of offers and total price captured inside the ring B.

Quantity and price are dynamically updated at C and D. Confirmation proceeds as usual at E.



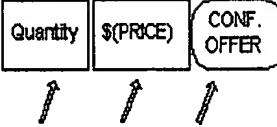
C  
D  
E

Fig. 15



In this example, the generated ring has a greater diameter, capturing a greater number of offers than are captured in figure 12.

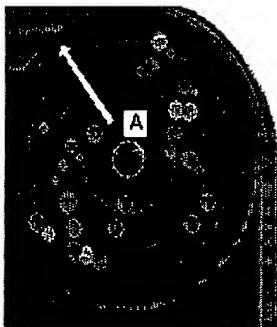
Quantity and price are again dynamically updated at C and D. Confirmation takes place at E.



C  
D  
E

(m) In one embodiment, a buyer or seller in the center can dynamically vary his or her offering price by "grabbing" the Pitometer field and moving it closer or farther from the center. This is illustrated in Figure 16 (pulling the field away from the center) and Figure 17 (pulling the field closer).

Fig. 16



As the Pitometer field is dragged away from the center at A, offering price is dynamically updated at B. Dragging the field from the center results in a higher offer.

Confirmation is given at C.

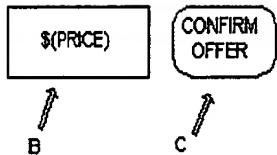
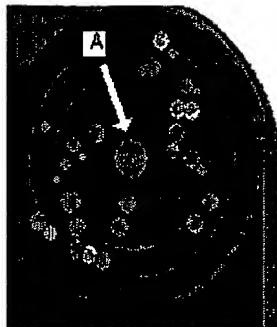
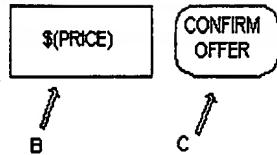


Fig. 17



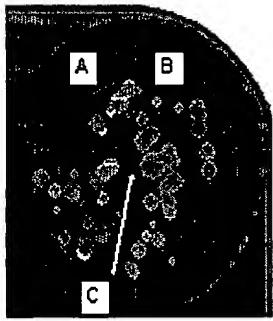
Here, the Pitometer field is dragged towards the center at A. Dragging the field from the center results in a lower offer. Offer price is updated at B.

Confirmation is given at C.



(n) In one embodiment, the Pitometer can be generalized to show many buyers and sellers at the same time. See Figure 18. Similar interactive features are implemented for the double screen as were described in subheadings (a) through (m), above, including drag and drop offers, dynamic price adjustment, and intuitive cash and unit management.

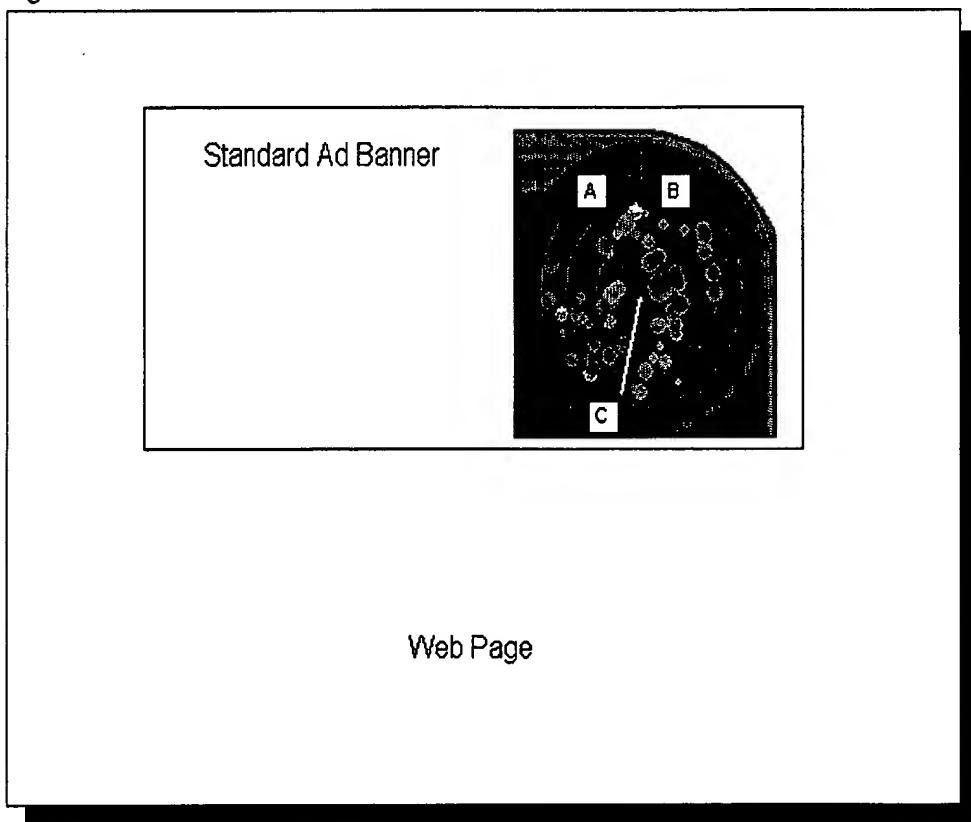
Fig. 18



This Pitometer shows multiple buyers and sellers. For example, the A side could represent buyers and the B side could represent sellers. Transactions are still consummated at the center (see C).

(o) In one embodiment, the Pitometer can be displayed over the Internet or other network as a banner advertisement, which will give users the opportunity to see markets in a live fashion throughout the world wide web. See Figure 19. Users can interact with the banner ad Pitometer as well. One implementation uses either DHTML and Java, or DHTML and Javascript, although other implementations are possible.

Fig. 19



From the above description and drawings, it will be understood by those of ordinary skill in the art that the particular embodiments shown and described are for purposes of illustration only and are not intended to limit the scope of the invention. Those of ordinary skill in the art will recognize that the invention may be embodied in other specific forms without departing from its spirit or essential characteristics. References to details of particular embodiments are not intended to limit the scope of the invention.